UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
3616 W. Thomas, Suite 6
Phoenix, Arizona 85019

2-21-90-F-254

November 9, 1990

R. Forrest Carpenter
Deputy Regional Forester
U.S. Forest Service
517 Gold Avenue, S.W.
Albuquerque, New Mexico 87102-0084

Dear Mr. Carpenter:

This responds to your request of August 2, 1990, for formal consultation pursuant to Section 7 of the Endangered Species Act (Act) of 1973, as amended, on proposed introduction of Gila topminnow (Poeciliopsis occidentalis occidentalis) into eight sites on the Prescott and Tonto National Forests in Gila, Maricopa, and Yavapai Counties, Arizona. The endangered Gila topminnow is the only federally listed species of concern in this action. The 90-day consultation period began on August 20, 1990, the date your request was received in our office.

The following biological opinion is based on information provided in the July 3, 1990 biological evaluation, as modified by telephone conversations with the Zone Fisheries Biologist, Tonto National Forest (October 22, 1990), Forest Service (USFS) staff on the Tonto Basin (October 18 and 25, 1990), Globe (October 18, 1990), and Mesa (October 23, 1990) Districts of the Tonto National Forest, and staff of the Verde District of the Prescott National Forest (October 24 and 25, 1990); and a letter of October 24, 1990 from the Cave Creek District of the Tonto National Forest. Supplemental information was obtained from data in Fish and Wildlife Service (FWS) and Arizona Game and Fish (AGFD) files and other sources of information.

BIOLOGICAL OPINION

It is my biological opinion that implementation of the proposed introductions of Gila topminnow, proposed continuation of existing land uses at the introduction sites, and certain future anticipated management actions are not likely to jeopardize the continued existence of the endangered Gila topminnow.

BACKGROUND INFORMATION

Species Description

The Gila topminnow was listed as an endangered species on March 11, 1967. No critical habitat has been designated for this species. The Gila topminnow is a small, one to two-inch long, livebearing fish (Minckley 1973) of the family Poeciliidae. It is known from the Gila, Sonora, and de la Concepcion River drainages in Arizona, New Mexico, and Sonora, Mexico (Minckley 1973, Vrijenhoek et al. 1985). The Gila topminnow was once among the commonest fishes in the Gila River and its tributaries (Hubbs and Miller 1941). Destruction of its habitat through water diversion, stream downcutting, backwater draining, vegetation clearing, channelization, water impoundment, and other human uses of natural resources; plus competition with and/or predation by nonnative fish species, most notably mosquitofish (Gambusia affinis), have resulted in extirpation of the Gila topminnow throughout most of its range (USFWS 1984, Meffe et al. 1983). At present, the Gila topminnow is known from only 9 naturally occurring localities in the United States, about 30 introduced populations, and several captive populations.

Project Description

The proposed project would stock Gila topminnow into eight waters on the Tonto and Prescott National Forests. The purpose of the project is to further the conservation of the Gila topminnow through establishment of additional recovery populations. No fewer than 200 Gila topminnow, of the appropriate genetic stock for the sub-basin, would be placed into each of the 8 sites. Advice on the appropriate genetic stock would be obtained from the Desert Fishes Recovery Team. Stocking would take place in late spring or summer to allow time for breeding and population establishment prior to onset of cold weather. Stock would be obtained from naturally occurring topminnow populations and may result in removal of up to 50 percent of the donor population.

In addition, the proposed project would continue ongoing activities conducted, authorized, funded, and permitted by the USFS in the area of the proposed introduced populations of Gila topminnow, and would provide for future foreseeable activities.

Only those activities addressed in this biological opinion are covered by this consultation. Possible future activities conducted, funded, or authorized by the USFS which are not considered in this biological opinion include, but are not limited to, mining, water development and diversion, introduction of other species into the vicinity of the topminnow, and construction of roads, buildings or other facilities at these sites. All such activities would require further Section 7 consultation.

Site Descriptions

1. Reimer Spring, Verde District, Prescott National Forest. Located in T12N, R4E, SE 1/4 Sec. 6 at 4450 feet elevation. Reimer Spring is in Reimer Draw in the Black Hills and drains, via other tributaries, into the Agua Fria River. This site was proposed for Gila topminnow and desert pupfish stocking by AGFD in January 1990, after a 1989 site visit. It is a well-watered spring with abundant riparian vegetation, primarily shallow water, but with sufficient pools for fish. The largest pool is 7 meters long, 7 meters wide and 0.5 meters deep. Water is clear with a sand/silt substrate. There is about 400 meters of perennial water.

Ongoing USFS activities at Reimer Spring include grazing, prescribed burning, roads, recreation, and livestock water development. Cattle are grazed under a USFS permit and managed under an existing Allotment Management Plan (AMP). The AMP schedule is a three-year rotation with 18 months of rest on the third year. Reimer Spring itself has been fenced to exclude cattle use. That fence is now down and cattle have been using the exclosure. The USFS expects to fix the fence soon. Road access to Reimer Spring is by primitive road, not maintained by the USFS. All roads in the area are closed to travel during wet weather and are signed as such. Off-road-vehicle use is confined to designated roads only. Recreation at Reimer Spring is light, consisting primarily of hunting. Reimer Spring lies within the Agua Fria grasslands, for which there is a USFS prescribed burning plan. The plan calls for burning most areas about every 10 years. The area around Reimer Spring was burned about 8 years ago. The spring itself and all riparian areas are specifically excluded from burning. A livestock watering system takes water from Reimer Spring and pipes it about 1/2 mile to a trough. No springbox exists, the intake is a simple pipe lying in the springrun.

2. West Fork Pinto Creek, Globe District, Tonto National Forest. Located in T1N, R13E, SE 1/4 Sec. 7 at 3400 feet elevation. West Fork Pinto Creek is tributary to Pinto Creek which drains into the Salt River in the upper end of Lake Roosevelt. This site was visited on July 7, 1989 by AGFD, USFS, and FWS biologists, and proposed for stocking of Gila topminnow and desert pupfish by AGFD in January 1990. The habitat consists of about 1/2 to 3/4 miles of perennial stream reach above a large plunge pool that is over 8 feet deep. Below the plunge pool, perennial water continues for an unknown distance through a rocky gorge with difficult access. At the time of the visit, the habitat consisted of run/riffle habitat with interspersed pools and abundant filamentous algae. Water temperature was 97° F, water was clear, and the substrate was sand, cobble, boulders, and bedrock. The riparian vegetation is mature sycamore and cottonwood. Longfin dace (Agosia chrysogaster) are abundant in the stream and leopard frogs (Rana sp.) are present.

Perennial flow in West Fork Pinto Creek crosses both private and USFS lands. Gila topminnow planted in the USFS portion of the stream would spread throughout the private portion as well. This private area is owned by the estate of Jack Reeder. The heir is not interested in retaining the land and it is currently for sale.

Several ongoing USFS activities occur on West Fork Pinto Creek. Livestock use occurs on both USFS and private lands. Cattle are grazed by permit on the USFS lands under an existing AMP that provides for a three pasture system with pastures rotated on a six month basis. Cattle use West Fork Pinto Creek and its riparian area for water and forage. Forest Service Road 287A descends from the east into the West Fork Pinto Creek but ends at a locked gate on the private property boundary. This road is regularly maintained by the USFS. Forest Service trail 212 (foot and horse) leaves the road in the vicinity of the gate and proceeds up West Fork Pinto Creek into the Superstition Wilderness, descending to the stream bottom upstream from the perennial flow. This trail is regularly maintained. Recreation in the area is moderate consisting primarily of hiking, horseback riding, hunting, and camping. Motorized vehicular use is restricted to designated roads. Fences for management of livestock are present in the area and are maintained on a regular basis by the USFS or the grazing permittee. Spring developments for livestock water exist within the drainage and are maintained.

3. Cottonwood Creek, Tonto Basin District, Tonto National Forest. Located in T3N, R12E, NW 1/4 Sec. 9 at an elevation of 3400 feet. Cottonwood Creek was formerly tributary to the Salt River but now flows into Lake Roosevelt. In 1982, Gila topminnow were stocked in this stream in a location near that currently proposed (T3N, R12E, Sec. 5; AGFD site #55). That stocking had failed by 1985 for unknown reasons. This site may also have been referred to as Water Users Spring. Restocking of this site was proposed by USFS biologists.

Cottonwood Creek has a perennial flow of about two miles. Downstream from Cottonwood Spring, it is a moderate sized creek with substantial woody debris providing diverse aquatic habitat including backwaters and pools with cover. Riparian vegetation consists of cottonwood and willow with an upward trend in condition.

Ongoing and foreseeable USFS activities at Cottonwood Creek are limited. Cottonwood Creek lies within a permitted livestock grazing allotment. Cattle are grazed under an existing AMP and use Cottonwood Creek and its riparian vegetation for water and forage. Road access to the area is by a non-maintained four-wheel drive track. This track may be closed in the future due to land management planning in progress. Little human use of the area occurs. Recreation is very light and is principally hunting. Motorized vehicles are restricted to designated roads. Fencing for livestock control is present and future activities include maintenance, reconstruction, and realignment of those fences.

4. Artesian Well #3, Tonto Basin District, Tonto National Forest. Located in T6N, R11E, NW 1/4 Sec. 8 at 2660 feet elevation. Artesian Well #3 is an artificial site and is not part of a drainage system. It lies within the Tonto Creek drainage of the Salt River subbasin. This site was originally stocked with Gila topminnow in 1982 (AGFD site #40). That population persisted until 1989 when it was lost due to dredging of the site by the grazing permittee. Restocking of this site has been proposed by USFS biologists. The site consists of an artesian well, producing about 0.33 gallons of water per minute in August 1989. This flow supports about 10 feet of stream which drains into a pond about 20 feet long, 8 feet wide, and 1 foot deep. A system exists to pipe water from that pond to a livestock trough located about 200 yards to the southwest. In August 1989, the water was muddy and 84° F in the pool. Riparian vegetation consists of 2 mesquite and one small willow. The pond has had a heavy growth of cattails (Typha sp.) in the past (Simons 1987) which are now redeveloping following dredging.

The well and pond are located inside a fenced corral. This corral is a holding and gathering facility for livestock, resulting in heavy livestock use and trampling of the pond and stream banks. Grazing of this allotment is permitted by the USFS and is managed under a rest rotation AMP. Trend on the allotment is improving. Maintenance and reconstruction of livestock fences in the area, including around the spring, are expected to occur on an ongoing basis. All-terrain-vehicle use by local residents and general recreation are heavy in the area, although motorized vehicles are restricted to designated roads. A road to the site exists and may require future maintenance. Maintenance and repair of the well, the berm retaining the pond, and the system for piping water to the livestock trough are expected to occur on an infrequent, but periodic basis. Mining activities are prominent in the area, although no mining activity is occurring in the immediate vicinity of Artesian Well #3. Mining activities are not foreseeable and are not a part of this proposed action or the consultation.

Cattails are a continuing problem at Artesian Well #3. Their growth in the pond is rapid and tends to clog the area reducing the available surface water. A structure which was built to shade a portion of the pool, and presumably help prevent cattail growth, has fallen into the pool and is probably not repairable. The USFS anticipates that future action to remove cattails will be necessary. This removal would be done by hand tools or heavy equipment. Herbicides may also be considered.

5. Middle Water Spring, Tonto Basin District, Tonto National Forest. Located in T5N, R10E, NW1/4, NE1/4 Sec. 33 at 4900 feet elevation. Middle Water Spring is in the Mazatzal Mountains on upper Ash Creek, which is tributary to Tonto Creek at the upper end of Lake Roosevelt. The site

consists of a natural spring which flows about 30 to 40 feet into a small pool, about 20 to 30 feet in diameter. The pool is impounded by a small artificial berm. A population of an unknown species of fish is present in the pool. Vegetation around the spring and pool is sedges and rushes with no overstory.

The spring is located immediately alongside Forest Road 422 (El Oso). This road is maintained by the USFS and is well-used by recreationists. The area receives a lot of general recreation and hunting use. Cattle are grazed under USFS permit on an allotment which presently has no livestock management plan. An AMP will be prepared for the allotment in the coming year. Maintenance and repair of the berm which impounds the spring water is expected to be required at infrequent intervals in the foreseeable future. The USFS has recently completed a prescribed burn in the vicinity of the spring and anticipates repeating that burn within the next 15 years. The spring itself was not burned.

6. Long Gulch Artesian, Tonto Basin District, Tonto National Forest. Located in T5N, R12E, NW 1/4 Sec. 33 at 2300 feet elevation. Long Gulch is formerly tributary to the Salt River, now Roosevelt Lake. This site was proposed for topminnow and pupfish introduction by USFS biologists. The site is a cienega or marsh type habitat. Water originates from an artesian well and flows into three small pools; each pool is about 30 feet long, 10 feet wide, and a couple of feet deep. There is no substantial surface flow between pools. Output of the well has been monitored and the least flow measured was 10 gallons per minute. Vegetation consists of sedges, rushes, and other marsh vegetation with some willow. Lowland leopard frogs (Rana yavapaiensis) are present. The site is about one mile above Lake Roosevelt and will not be affected by the planned raising of water level in the lake. No surface water connection exists between the marsh and Roosevelt Lake, thus preventing any access to the site by nonnative fishes from the lake.

Not all of the water from the well goes into the marsh area. A double fitting on the wellhead allows part of the water to flow into the marsh. The remaining water flows, via a plastic pipe, to an adjacent area where it flows onto the ground to provide green forage for geese. The USFS plans to reroute the water currently going to the goose forage area to a small dirt tank that has been dug in the gulch about 1/2 mile below the well. The proposed action includes moving Gila topminnow into that tank after it has been filled and has developed into a suitable habitat.

Long Gulch Artesian is located in the Roosevelt Lake Wildlife Area, under joint management of the AGFD and USFS. The area is seasonally closed to public entry from November 15 through February 15. Livestock grazing is permitted in the area by the USFS. Cattle are managed under an existing AMP.

Cattle use the marsh and well for water and forage. Fences for livestock management exist in the area and are maintained by the USFS or the grazing permittee. The well and its fittings and the new earthen tank in the gulch below the marsh are expected to require infrequent, but periodic, maintenance and repair. Long Gulch Artesian is reached by two miles of four-wheel drive road which is not maintained. Recreational use of the area is very low. Motorized vehicle use is restricted to designated roads.

Long Gulch Artesian is part of a potential mitigation area for impacts to geese from raising the water level in Roosevelt Lake. Losses of goose habitat to inundation would be mitigated by irrigation of large areas of land by water from Long Gulch Artesian to grow crops for goose forage. Topminnow would not be stocked until a decision has been reached regarding this mitigation plan. If it is decided that Long Gulch Artesian will be used for mitigation of impacts to geese, then additional consultation will be conducted on that plan.

7. Mesquite Tank #2, Mesa Ranger District, Tonto National Forest. Located in T2N, R9E, SW 1/4 Sec. 1 at 2030 feet elevation. Mesquite Tank #2 is on a drainage tributary to Tortilla Creek which flows into Canyon Lake in the Salt River subbasin. This site was stocked with Gila topminnow in 1982. That population persisted until the tank was drained by unknown persons who opened a valve in the concrete dam. When monitoring was done in 1985, the site was dry and no topminnow survived. However, topminnow had washed downstream and a large population now persists in bedrock pools in a site called "Unnamed drainage #68" (AGFD site 68B). Restocking with Gila topminnow and stocking with desert pupfish was proposed by AGFD in January 1990 after 1989 monitoring. This tank has an 8-foot tall concrete dam across a narrow drainage, impounding runoff. A drain valve is present in the dam. In 1989, water in the tank was about 1.1 meters deep with a silt substrate.

The concrete dam which impounds Mesquite Tank #2 may require maintenance or repair at some time within the foreseeable future, and the tank may need to be dredged to remove accumulated silt. Mesquite Tank #2 is in an area now closed to livestock grazing, and no future grazing is expected. A four-wheel drive road (FR 1827) accesses the site but is not maintained by the USFS. The area is open to motorized vehicle use only on designated roads. Recreation is light, consisting primarily of hunting. Mesquite Tank #2 is an important water source for game animals.

8. Sycamore Creek, Cave Creek District, Tonto National Forest. Located in T9N, R7E, NE 1/4 Sec. 29 at 2630 feet elevation. Sycamore Creek is tributary to the Verde River just upstream from Horseshoe Reservoir. This site was recommended for stocking of Gila topminnow and desert pupfish by AGFD in January 1990. Their 1989 survey of the site reported a dense riparian

habitat surrounding a perennial stretch of stream of unknown length. Pools up to 2 meters deep are present. Native longfin dace and nonnative green sunfish (Lepomis cyanellus) and largemouth bass (Micropterus salmoides) are present in the stream. Beaver (Castor canadensis) are present, and introduced river otters (Lutra canadensis) may also occur in the creek.

Cattle are grazed at the site under a USFS permit with an existing AMP providing for a rest-rotation system. Several fences for livestock management are present in or near the site. These fences are maintained by the USFS or the grazing permittee. No roads currently exist to the site. Sycamore Creek flows out of the Mazatzal Wilderness with the perennial stretch located on the wilderness boundary. A foot and horse trail (USFS 11) crosses Sycamore Creek less than 1/4 mile upstream from its confluence with the Verde River and is a popular entry point into the Wilderness. This trail is periodically maintained by the USFS. Recreation use is considerable, consisting of hunting, camping, horseback riding, and hiking. Commercial outfitting and guiding is permitted on a limited basis by the USFS. A parking lot and various recreation development projects may be proposed in the future for the area along Forest Road 479, downstream from the confluence of Sycamore Creek and the Verde River.

A 107-acre inholding of private land is located on Sycamore Creek. This parcel is owned by Joe Manterola. The Nature Conservancy has offered to purchase the inholding, but their offer was refused. The USFS has identified the property as a high priority for acquisition. If the private landowner were to request a right-of-way from the USFS to construct a road to the inholding, the USFS could not deny reasonable access.

Several nonnative fish species are present in the Verde River and may eventually move upstream into Sycamore Creek. To prevent this, the USFS plans to construct a fish barrier near the mouth of Sycamore Creek. This barrier would require periodic repair and maintenance.

IMPACTS OF THE ACTION

Direct and Indirect Effects of the Proposed Action

The overall effect of the proposed action, if successful, would be beneficial to the survival and recovery of the Gila topminnow. However, some adverse effects may occur due to certain characteristics of the sites selected and to ongoing and foreseeable future USFS activities.

1. Effects of Stocking into Proposed Sites

The primary concern in these introductions is to maximize the probability of establishing successful long-term populations of Gila topminnow and to preserve the genetic diversity and structure of the species. Factors which may influence long-term success of reintroduced populations include permanence of water; water quality, quantity, and temperature; elevation; substrate; habitat configuration; vulnerability to flooding; presence of nonnative fish in or near the site; human activities in the area; whether the water source and habitat are artificial or natural; and others.

Information available on habitat characteristics and suitability for Gila topminnow is extremely limited for the sites proposed here. Additional information would be valuable in predicting long-term success of each population and would also give clues as to the reasons for failure, if that occurs. Lack of such information may result in adverse effects to the Gila topminnow through loss of populations and loss of information regarding habitat suitability.

Although all sites proposed would fit within the overall effort for Gila topminnow recovery, some advantages and disadvantages are associated with each site. Reimer Spring appears to have a high likelihood for long-term suitability for Gila topminnow. No adverse effects from stocking this site are anticipated. The same applies to the West Fork Pinto Creek and Cottonwood Creek. All three sites have relatively large areas of apparently perennial water with no nonnative fish, have no major adverse human impacts, require no human intervention to maintain the habitat, and are relatively invulnerable to adverse human impacts or to invasion of nonnative fish.

Long-term suitability of the habitat at Artesian Well #3 has been demonstrated by survival of a population of topminnow there for 7 years (1982-89). That population was apparently thriving before being eliminated by human actions. The site is artificial and would require human intervention to maintain the well and impoundment. Periodic removal of cattails may also be required. Adverse effects to Gila topminnow are possible due to failure of the site if human maintenance does not occur. However, we believe that Artesian Well #3 would support Gila topminnow and that stocking of the site would benefit the species.

Middle Water Spring has several disadvantages as a Gila topminnow introduction site. Fish are present which, if nonnative, would need to be removed prior to stocking of topminnow. Presence of nonnative fish indicates that the site is vulnerable to unauthorized stocking of nonnative fish. The pond is an artificial habitat, impounded by man, and is likely to fail without human intervention. The site has only a moderate probability of sustaining Gila topminnow in the long-term and should not be a high priority site for stocking.

Long Gulch Artesian is another artificial site and would require human intervention to maintain Gila topminnow habitat. However, maintenance should be minor and the site appears to have a high potential for providing Gila topminnow habitat free of nonnative fishes. The potential for diversion of water from the well to provide goose habitat is a threat to this site. Until this issue is settled, the site should not be considered for topminnow introduction.

Mesquite Tank #2, like Artesian Well #3, has a demonstrated capacity for sustaining Gila topminnow on a short-term basis. Although topminnow persisted in this tank for only a few years, their demise was due to preventable human actions. If this tank can be protected against unauthorized draining, we believe that it should be stocked with topminnow. The persistence of Gila topminnow in the drainage downstream from the tank also argues for suitability of the site.

Sycamore Creek has several disadvantages as a Gila topminnow introduction site. It already has two nonnative fish present and may require construction of a fish barrier to prevent access by other nonnatives present in the Verde River. That barrier would require long-term maintenance. The recreation use in the area and its proximity to the Verde River make the site vulnerable to unauthorized stocking with bait fish. The presence of a private inholding may create future conflicts between private actions and Gila topminnow, e.g. construction of a road up the drainage. Counterbalancing advantages include the relative inaccessibility of the site and availability of a relatively large high quality habitat. If an effective natural fish barrier is present or an artificial barrier is constructed, we believe that introduction of Gila topminnow into Sycamore Creek may benefit the species.

2. Effects of Proposed Stocking on Topminnow Genetic Diversity

In order to protect the genetic structure and diversity of the Gila topminnow, and thus the evolutionary potential of the species, the upcoming revision of the Gila Topminnow Recovery Plan will prescribe which natural stocks of Gila topminnow should be introduced into various portions of the Gila Basin. Because this plan has not yet been formulated, we cannot, at this time, specify which stocks should be used for the eight sites proposed. The FWS and AGFD are presently working on interim guidance on topminnow stock selection and hope to have it reviewed by the Desert Fishes Recovery Team and made available by spring 1990.

Past introductions of Gila topminnow have been made without concern for replication of each existing natural population and preservation of the purity of each natural genetic stock. However, rapidly developing information regarding the existence of, and need for, protecting genetic diversity has made that type of random introduction obsolete. The Desert Fishes Recovery Team and FWS believe that maximum protection can be achieved

through replication of each natural population, segregation of lineages into specific areas of the Gila basin, and experimental mixing of lineages in other specified areas of the basin. To proceed with the proposed introductions before the interim plan is available, or in a manner not in accordance with that plan, would adversely affect the survival and recovery of the Gila topminnow.

3. Effects of Removal of Stock from Donor Populations

Reduction of Gila topminnow donor populations by removal of fish for introduction into proposed sites may have adverse effects on the donor population. The extent of these effects would vary with different donor populations. If the appropriate stock is Sharp Spring, that stock can be obtained from Dexter National Fish Hatchery with no adverse effects to the species as a whole. For all other stocks, care must be exercised to avoid damaging the donor population. We believe the proposed reduction of the donor population by up to 50 percent may result in unacceptably large adverse effects. Although it is true this species has a high reproductive potential and would likely rebound immediately, such a high reduction substantially increases the risk of damage to the donor population if stochastic events (flood, drought, etc.) follow that reduction. Adverse effects may also occur if even a small number of Gila topminnow are taken out of a natural population that is already depressed by other events.

4. Effects of Ongoing and Foreseeable Future Activities

Each of the sites proposed for introduction of Gila topminnow is subject to various ongoing and foreseeable future activities that are conducted, permitted, funded, or otherwise authorized by the USFS. While these activities are expected to have some adverse effects on the survival and recovery of the Gila topminnow, the overall effect is not expected to be substantial and would not jeopardize the continued existence of the species. However, care should be taken to ensure that adverse impacts from all of those activities are minimized.

Six proposed sites are subject to livestock grazing under USFS permits, and a seventh (Reimer Spring) is within a grazed area, although the spring is in a fenced exclosure. Livestock grazing generally has many direct and indirect effects on aquatic habitat. However, the current grazing at the seven proposed sites appears to be compatible with the survival of the Gila topminnow in these sites. Changes in livestock type, numbers, distribution, management, etc. that are not included in the existing AMP's, or which differ from present practices, are not covered by this biological opinion and must be the subject of additional Section 7 consultation.

Fences for management of livestock use are present at or near all of the proposed sites, except Mesquite Tank #2. These fences require periodic maintenance, repair, replacement, and minor realignment. Effects of the fences and their maintenance on the Gila topminnow could include sedimentation and habitat disturbance during work on portions of the fence which cross the stream, riparian destruction and sedimentation from work on fence portions along and through the riparian corridor, and changes in livestock distribution and use of the area. These effects are not expected to significantly affect the survival of the Gila topminnow in these sites.

Roads are present at all proposed sites, except Sycamore Creek. Some of these roads are user maintained, while others are USFS maintained. No substantial adverse effects to the Gila topminnow are anticipated from use or maintenance of the existing roads. Any realignment or expansion of these roads is not covered by this biological opinion and would need additional Section 7 consultation. Granting of a right-of-way for construction of a road to the private inholding on Sycamore Creek is also not covered by this biological opinion and would require further consultation.

Foot and horseback trails maintained by the USFS are present at West Fork Pinto Creek and Sycamore Creek. These trails, their maintenance and repair, and minor realignment are not anticipated to have any significant adverse impacts to the Gila topminnow.

Recreation occurs at all of the sites proposed for introduction of Gila topminnow. Recreation varies from heavy to very light and includes hunting, picnicking, hiking, horseback riding, swimming, camping, and other general recreation. In addition, commercial outfitting and guiding occur at Sycamore Creek and various recreational developments are planned near the mouth of the creek. These uses are not expected to have significant adverse effects on the Gila topminnow.

All proposed sites are located in areas which restrict off-road-vehicle (ORV) use to designated roads. This restriction should be sufficient to protect the proposed sites against any adverse impacts which might result from such use.

On the West Fork Pinto Creek there are existing spring developments within the watershed for livestock water. The existing developments and their maintenance and repair are not expected to have any substantial adverse effects on the Gila topminnow. Construction of additional such developments may have adverse impacts due to diversion of water from the West Fork Pinto Creek or through creation of impoundments which harbor nonnative fishes, particularly mosquitofish. Construction of additional developments would be subject to further Section 7 consultation.

The livestock water diversion on Reimer Spring, as presently operated, appears to be compatible with the presence of Gila topminnow at the site. This diversion may require ongoing maintenance and such action would not be expected to have major adverse effects on the spring. Enlargement of the existing system or installation of a new system may result in adverse impacts and would require additional Section 7 consultation.

The ongoing problem at Artesian Well #3 with cattails may require future management activities to control their growth. Possible management may include removal of the cattails by hand, heavy equipment, or herbicides, or retardation of cattail growth by addition of shade devices. The overall result of these activities would be beneficial to the Gila topminnow if the management is conducted with sufficient protection for the topminnow. Without that protection, the potential for significant adverse effects and incidental take would be high. Adverse impacts could occur through excessive turbidity and sedimentation, introduction of pollutants (machine oils, etc.), depression of food availability, reduction of protective cover, etc. Incidental take could occur through crushing of fish, removal of the fish from the water in discarded vegetative material, reduction of the ability of the habitat to sustain the population, increased predation due to lack of cover, etc.

Prescribed burning is a management tool that has been used and is expected to be used again in the areas near Middle Water Spring and Reimer Spring. This activity is not expected to adversely affect the Gila topminnow, as long as the burn does not include the springs themselves. Riparian areas and springs are normally specifically excluded from USFS prescribed burns.

Habitat and water routing modifications may occur at Long Gulch Artesian. Water currently going to an off-site area for goose forage production would be rerouted into a dirt tank downstream from the marsh and Gila topminnow introduced into that tank. These actions are not anticipated to have any adverse effects on the Gila topminnow and are not likely to jeopardize the survival of the Gila topminnow. However, potential diversion of water from Long Gulch Artesian, and/or habitat modification to provide for goose foraging and habitat may have substantial adverse effects on the Gila topminnow. Any such activity would require additional Section 7 consultation.

The proposed sites which are formed by human modifications of natural habitat or by artificial water sources would require future actions to maintain or repair the facilities. Artesian Well #3 may require maintenance or repair of the well and standpipe, the berm forming the tank, or the system for piping water off for livestock watering. Middle Water Spring may require repair or maintenance of the berm which impounds the pool. Long Gulch Artesian may require maintenance or repair of the well, well fittings, or the berm

impounding the earthen tank below the marsh. Mesquite Tank #2 may require maintenance or repair of the concrete dam which impounds the pool. All four sites may require removal of accumulated bottom sediments. These actions have the potential for substantial adverse effects to the Gila topminnow as well as potential for incidental take. Although the adverse effects are not expected to jeopardize the continued existence of the species, it is important that protective measures be employed while conducting any maintenance or repair of these systems to minimize the adverse impacts and the incidental take.

INCIDENTAL TAKE

Section 9 of the Act, as amended, prohibits any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of Sections 7(b)(4) and 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered taking within the bounds of the Act provided that such taking is in compliance with the incidental take statement. The measures below are nondiscretionary and must be undertaken by the agency or made a binding condition of any grant or permit issued to the applicant, as appropriate.

The FWS anticipates that the proposed project would result in incidental take of Gila topminnow through direct mortality during capture, transport, holding, and stocking; through direct and indirect mortality of individuals due to ongoing and future foreseeable activities in the area of the proposed introduction sites; and through indirect loss of Gila topminnow due to alteration or loss of habitat during ongoing and future foreseeable activities.

Loss of individual fish or the entire population of Gila topminnow at any of the eight proposed introduction sites would not constitute incidental take if those losses occur due to natural drying of the sites; natural failure of the water source; or any other factor which does not directly or indirectly result from an action of the USFS, an action authorized or regulated by the USFS, or from failure of the USFS to take reasonable measures to prevent adverse impacts resulting in take. No action would be required of the USFS to prevent or mitigate losses due to natural factors.

Because reliable estimates of populations of Gila topminnow are not obtainable due to sampling difficulties and to the rapid population changes inherent in short-lived species with high fecundity, the incidental take

anticipated as a result of the various aspects of this project cannot be quantified. Therefore, we have defined the following population parameters as indicators of incidental take that is greater than anticipated. Occurrence of any one or more of the following would trigger reinitiation of formal consultation.

1. Mortality greater than an estimated 25 percent of the Gila topminnow being captured, stocked, held, or transported during any given action.

2. Rapid declines in the gross abundance (using relative descriptors such as abundant, moderate, low, scarce) of Gila topminnow immediately following initiation of any action taken after stocking, or slower declines continuing over the year following the initiation of the action.

3. Lack of detectable reproduction in the population during the next reproductive season following completion of any given action.

Reasonable and Prudent Measures

The FWS believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take. Implementation of these measures shall be conducted in accordance with the terms and conditions in the following section.

1. Conduct all proposed actions in a manner which will minimize direct mortalities of Gila topminnow (Terms and Conditions 1.1 through 1.3).

2. Conduct all proposed actions in a manner which will minimize take of Gila topminnow habitat (Terms and Conditions 2.1 through 2.3).

3. Ensure that all Gila topminnow introductions conform to the long-term plan for preserving genetic diversity and structure (Term and Condition 3.1).

4. Implement monitoring of the effects of the proposed actions on Gila topminnow and their habitat so that actions can be modified to minimize take (Terms and Conditions 4.1 through 4.3).

5. Maintain complete and accurate records of actions which may result in take of Gila topminnow and their habitat (Terms and Conditions 5.1 through 5.3).

Terms and Conditions for Implementation

In order to be exempt from the prohibitions of Section 9 of the Act, the USFS is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above.

1.1 Numbers and timing of removal of introduction stock from approved donor populations shall be determined by consensus between the USFS endangered species fish biologist, AGFD Nongame fish biologist, and FWS endangered species fish biologist.

1.2 USFS shall remove and hold Gila topminnow during maintenance or repair activities on dams, berms, wells, pipes, infiltration systems, or other human-constructed facilities at the proposed introduction sites; during removal of bottom sediments from any of the human-modified sites; or during any action to remove or reduce cattails or other emergent vegetation. At least 200 Gila topminnow shall be captured and held until the action is completed and the turbidity and other water disturbances have returned to near pre-project levels. Those fish shall then be returned to the site. Captured stock shall contain a representative sample of adult females, males, and juveniles. The holding facilities for these fish must be of adequate size, water chemistry, and temperature to sustain the captured fish during the period of the action. The fish must not be held in any location where the potential exists for contamination of the stock with any other fish species. If the pre-project Gila topminnow populations are so small as to make capture of 200 fish impractical, then enough Gila topminnow shall be obtained from another source to provide a minimum of 200 fish (captured plus addition) to be returned to the site following the project. The additional Gila topminnow shall be obtained from a wild or captive site of appropriate genetic lineage. This supplemental stock will be subject to items 1.1, 3.1, 5.1, and 5.2 of this section.

1.3 Herbicides used to control cattails or other emergent vegetation in Gila topminnow habitats shall be applied by wiping or otherwise directly onto the plants and not by spraying.

2.1 Weld the cap permanently onto the drainage pipe at Mesquite Tank #2 or otherwise ensure that the tank cannot be drained.

2.2 The USFS shall notify livestock permittees and other forest users who have the potential for major adverse actions in the area of the introduced populations of the presence of the population of Gila topminnow and inform them of the provisions of Sections 7 and 9 of

the Endangered Species Act, as amended. For livestock permitees, the USFS shall include such notification in both the Allotment Management Plan and the annual operating plan for the allotment in which the Gila topminnow population is located. Past incidents, such as the destruction of the Artesian Well #3 population by dredging by the permittee, may be avoided through knowledge of the presence of the species and the legal protections afforded to it. This term and condition is not intended to require signing of Gila topminnow introduction sites.

2.3 All alternative methods shall be examined and the method least disruptive of Gila topminnow and their habitat shall be used for maintenance or repair activities on dams, berms, wells, pipes, infiltration systems, or other human-constructed facilities at the proposed introduction sites; for removal of silt from any of the human-modified sites; or for any action to remove, reduce, or inhibit cattails or other emergent vegetation.

3.1 Only Gila topminnow stocks identified by the FWS in association with the Desert Fishes Recovery Team for introduction into the Gila Basin subbasin in which the proposed site is located shall be used for the proposed introductions.

4.1 The USFS shall provide baseline habitat information on all sites stocked. Information shall include length of perennial water, availability and distribution of aquatic habitat types, riparian and aquatic vegetation, presence of fish, substrate type and distribution, water temperature, dissolved oxygen, human uses, road or trail access, and other factors which might be pertinent to Gila topminnow survival, reproduction, and protection. This information will help to evaluate causes of success and failure of these populations and the extent of incidental take. The information shall be provided in a written report to the FWS prior to or within one month after stocking.

4.2 Each stocked population shall be monitored at least once in the first six months following stocking, and monitoring data shall be submitted in writing to the FWS and AGFD within one month following monitoring. Monitoring shall include gross abundance of Gila topminnow; presence or absence of young topminnow; general distribution of the topminnow throughout the ponds, pools, or stream channel; water volume; relative turbidity; general habitat condition; changes in human uses of the area; and other pertinent data. This information may be collected by the USFS under the direct authority of this biological opinion and with appropriate State permits, or may be arranged for with other agencies, organizations, or individuals which hold or obtain appropriate Federal and State permits.

4.3 Each Gila topminnow population shall be monitored following completion of any maintenance or repair activities on dams, berms, wells, pipes, infiltration systems, or other human-constructed facilities at the proposed introduction sites; any actions for removal of bottom sediments from any human-modified site; or for any action to remove, reduce, or inhibit cattails or other emergent vegetation. Monitoring shall be done at a minimum of the following approximate time periods: one week, one month, six months, and one year following action completion. Baseline information shall be recorded prior to beginning any such action. Baseline information shall include gross abundance of Gila topminnow, presence or absence of young topminnow, general distribution of topminnow throughout the available habitat, water volume, relative turbidity, general habitat condition, and other pertinent data. Post-project information shall include the same kinds of data as for the baseline. This information may be collected by the USFS under direct authority of this biological opinion and with appropriate State permits, or may be arranged for with other agencies, organizations, or individuals which hold or obtain appropriate Federal and State permits. This information should be submitted in writing to the FWS within one month of completion of each step.

5.1 The USFS shall notify AGFD and FWS prior to any stocking of Gila topminnow.

5.2 The USFS shall notify AGFD and FWS, in writing, following any stocking, of the date of stocking, number of fish stocked, location, stock source, and any fish mortalities which occurred.

5.3 The USFS shall maintain a written record of any actions affecting the Gila topminnow at the proposed introduction sites, particularly maintenance or repair activities on dams, berms, wells, pipes, infiltration systems, or other human-constructed facilities at the proposed introduction sites; any actions for removal of silt from any of the human-modified sites; or for any action to remove, reduce, or inhibit cattails or other emergent vegetation. The record shall include documentation of the actions taken, sketches of before and after water configurations and profiles, and before and after photographs. This information shall be furnished, in writing, to the FWS within one month of completion of the action.

If, during the course of the proposed action, the amount or extent of the incidental take limit is reached, the USFS must reinitiate consultation with the FWS immediately to avoid violation of Section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible and adverse impact on the species, as required by

50 CFR 402.14(i). The USFS should provide an explanation of the causes of the taking.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term conservation recommendations has been defined as suggestions of the FWS regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibilities for this species.

Reimer Spring

1. Repair and regularly maintain the exclosure fence.

West Fork Pinto Creek

1. Acquire the private inholding on West Fork Pinto Creek. This parcel is currently for sale and should be acquired to prevent future problems between actions on the private lands and the upstream and downstream Gila topminnow population on USFS land.

Artesian Well #3

1. Remove the collapsed "umbrella" structure from the pond prior to stocking.

2. Conduct cattail eradication by hand or mechanical removal or by herbicides prior to stocking.

3. Plant native shade trees on the south and west sides to eventually provide shade to control the cattails. Protect the trees from destruction by livestock.

4. Take measures to reduce impacts to Gila topminnow during cattail control efforts conducted after topminnow are introduced. Restrict excavation of cattails to one-half of the pond and avoid walking in or disturbing the remaining half. Do not remove cattails from the other half until at least one month later.

Middle Water Spring

1. Survey Middle Water Spring to determine the species and relative abundance of existing fish in the spring. This survey should be conducted by a qualified fish biologist. Following this survey, assess the need for removal of existing fish prior to stocking with Gila topminnow. The decision regarding the need for removal of the existing fish should be a consensus between USFS, FWS, and AGFD fish biologists.

Sycamore Creek

1. Survey the creek for presence/absence of a natural barrier to upstream migration of nonnative fish from the Verde River. If such a barrier is not present, then construct a barrier to movement of fish upstream from the Verde River. Stocking this site in the face of likely invasion by predatory and competitive nonnative fishes would most likely result in the loss of the topminnow. Gila topminnow should not be introduced into this site until a barrier is in place and functioning effectively.

2. Acquire the private inholding on Sycamore Creek.

All Sites with Artificial Impoundments or Water Sources

1. Conduct all maintenance and repair of dams, berms, wells, pipes, infiltration systems, or other human-constructed facilities at the proposed introduction sites and any projects to remove bottom sediments or emergent vegetation, during spring, summer, or early fall when Gila topminnow are reproducing. Incidental population size reductions and stresses on individual topminnow just prior to onset of cold weather and cessation of reproduction should be avoided. Such losses may force the population through a bottleneck with consequent losses of genetic diversity and adaptability.

2. Minimize disturbance of the habitat and take measures to minimize turbidity and sedimentation during any maintenance or repair of dams, berms, wells, pipes, infiltration systems, or other human-constructed facilities at the proposed introduction sites. Such measures may include partitioning the action area from the remainder of the water by berms, plastic, cloth or mesh barriers; monitoring of turbidity and dissolved oxygen levels; and other measures tailored to the specific action.

All Sites

1. Do not permit diversion of spring flows.

2. Take steps to ensure that no pollutants (oils, cement, pesticides, etc.) enter the water during any activities in the vicinity of these proposed sites.

3. Avoid any actions which would substantially increase the likelihood of introduction of nonnative fish or other nonnative aquatic life.

4. Minimize disturbance when conducting activities in the vicinity of the proposed sites, such as fence repair and maintenance, road and trail repair and maintenance, prescribed burning, etc. Particular care should be taken when working in the water, such as on places where fences, trails, or roads cross the stream or springrun.

In order for the FWS to be kept informed of actions that either minimize or avoid adverse effects or benefit listed species or their habitats, the FWS is requesting notification of the implementation of any conservation recommendations.

CONCLUSION

This concludes formal consultation on this action. As required by 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

If we can be of further assistance, please contact Sally Stefferud or Sam F. Spiller, Field Supervisor (FTS 261-4720 or 602/379-4720).

Sincerely,

Denise L. Baker

Denise L. Baker
Acting Field Supervisor

cc: Director, Arizona Game and Fish Department, Phoenix, Arizona
Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico (FWE/HC)
Forest Supervisor, Tonto National Forest, Phoenix, Arizona
Forest Supervisor, Prescott National Forest, Prescott, Arizona